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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,716

06/05/2006

Zoubair Mohammed Cherkaoui

Q94723

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23373 7590 04/07/2011  
SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER

WU, SHEAN CHIU

ART UNIT

PAPER NUMBER

1722

NOTIFICATION DATE

DELIVERY MODE

04/07/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
USPTO@SUGHRUE.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,716	<b>Applicant(s)</b> CHERKAOUI ET AL.
	<b>Examiner</b> Shean C. Wu	<b>Art Unit</b> 1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 47-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 47-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| <p>1) <input type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br/>Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
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## **DETAILED ACTION**

### **Claim Rejections - 35 USC § 112**

1. Claims 47-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 47, 52 and 55-56, the preferably phrase for notations  $R^1$ ,  $R^2$  and X is indefinite.

Regarding claim 53, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

### **Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### **Claim Rejections – 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1722

4. Claims 55 and 56 are rejected under 35 U.S.C. 102(b) as anticipated by WO 0055110 or equivalent US 6,733,690 (US '690).

The reference discloses a novel liquid crystal compound represented by formula



wherein

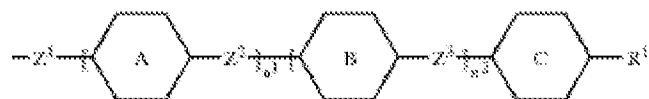
$G^1$  and  $G^2$  independently represent a polymerisable mesogenic residue;

X represents a group selected from  $-\text{CH}_2-$ ,  $-\text{O}-$ ,  $-\text{CO}-$ ,  $-\text{COO}-$ ,  $-\text{OOC}-$ ,  $-\text{CONR}'-$ ,  $-\text{OCOO}-$ , and  $-\text{OCONR}'-$ ;

$\text{Sp}$  represents a group of the formula  $-(\text{CH}_2)_p-$  in which p is an integer of 1 to 18 and in which one or two non adjacent  $-\text{CH}_2-$  groups are optionally replaced by  $-\text{CH}=\text{CH}-$ ; or in which one or two  $-\text{CH}_2-$  groups are optionally replaced by one or two groups selected from the group consisting of  $-\text{O}-$ ,  $-\text{CO}-$ ,  $-\text{COO}-$ ,  $-\text{OOC}-$ ,  $-\text{CONR}'-$ ,  $-\text{OCOO}-$ , and  $-\text{OCONR}'$  with the proviso that firstly the spacer group does not contain two adjacent heterostoms and secondly when X is  $-\text{CH}_2-$ , p can also have a value of 0; and

Art Unit: 1722

M represents an achiral group of formula (II)



in which

A and B independently represent an optionally substituted six membered isocyclic or heterocyclic group or naphthalenediyl;

C is selected from the group consisting of an optionally substituted five and six membered isocyclic or heterocyclic group or naphthalenediyl;

$n^1$  and  $n^2$  are 0 or 1 with the proviso that firstly  $1 \leq n^1 + n^2 \leq 2$  and secondly, when C is naphthalenediyl  $0 \leq n^1 + n^2 \leq 2$ ;

$Z^1$  is selected from the group consisting of  $\text{---O---}$ ,  $\text{---COO---}$ ,  $\text{---OOC---}$ ,  $\text{---CO---}$ ,  $\text{---CONR}^1\text{---}$ ,  $\text{---NR}^1\text{CO---}$ ,  $\text{OCCO---}$ ,  $\text{---OCONR}^1\text{---}$ ,  $\text{---NR}^1\text{COO---}$  and a single bond;

in which

$R^1$  is selected from the group consisting of hydrogen, a lower achiral alkyl group and a lower achiral alkenyl group;

$Z^2$  and  $Z^3$  are independently selected from the group consisting of single bond,  $\text{---COO---}$ ,  $\text{---OOC---}$ ,  $\text{---CH}_2\text{---CH}_2\text{---}$ ,  $\text{---CH}_2\text{O---}$ ,  $\text{---OCH}_2\text{---}$ ,  $\text{---CH=CH---}$ ,  $\text{---C}\equiv\text{C---}$ ,  $\text{---(CH}_2)_x\text{---}$  and  $\text{---(CH}_2)_x\text{O---}$ ; and

$R^2$  is selected from the group consisting of  $\text{---CN}$ ,  $\text{---COR}$ ,  $\text{---COOR}$ ,  $\text{---OCOR}$ ,  $\text{---CONR}^1\text{R}$ ,  $\text{---NR}^1\text{COR}$ ,  $\text{OCCOR}$ ,  $\text{---OCONR}^1\text{R}$ ,  $\text{---NR}^1\text{COOR}$ ,  $\text{---F}$ ,  $\text{---Cl}$ ,  $\text{---CF}_3$ ,  $\text{---OCF}_3$ ,  $\text{---OR}$  and  $\text{---R}$

in which

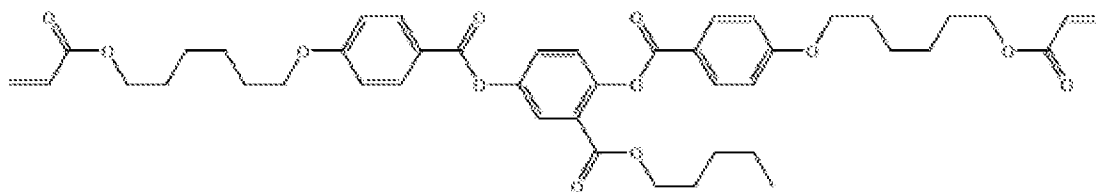
R is selected from the group consisting of hydrogen, an achiral  $C_{1-18}$  alkyl group and an achiral  $C_{4-18}$  is alkenyl group with the double bond at 3-position or higher; and

$R^1$  is as defined above;

with the proviso that at most one of the rings A, B and C is a naphthalenediyl group.

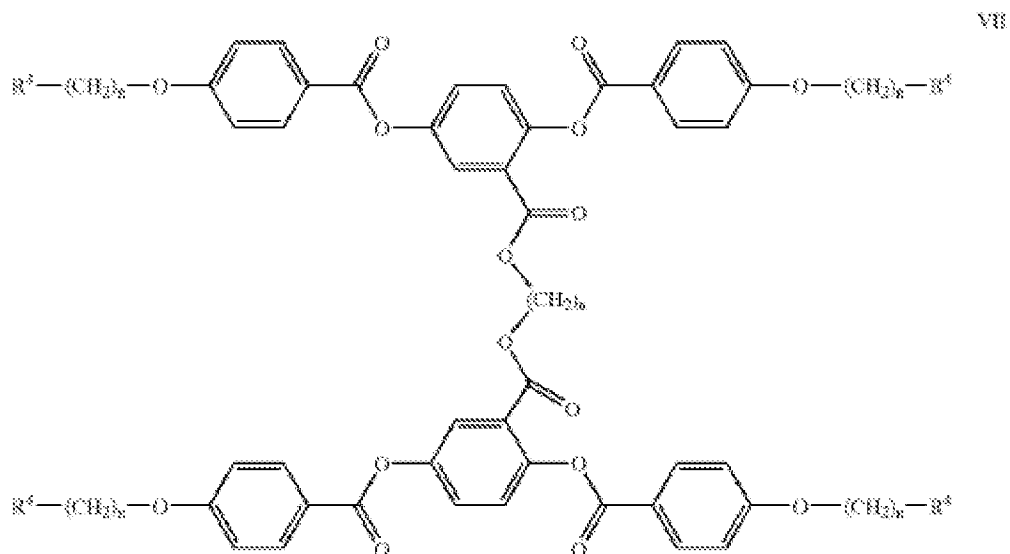
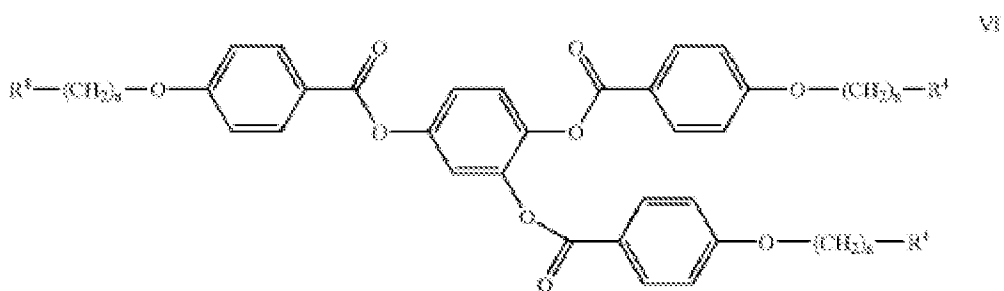
The reference compounds of formula I are compatible with other mesogenic molecular. The reference compound shown below in Example 3 is useful as curable liquid crystals and for preparing liquid crystal films.

Art Unit: 1722



P-Sp-X

The compounds above can be further crosslinked as following:



. The present Sp does not require having an alkyl-ester-alkyl group or chiral additive if

Art Unit: 1722

each group  $R^1$  and  $R^2$  is hydrogen ( $m^2=1$ ) and rest of  $CH_2$  is straight chain for Sp in formula (III). Also, the reference examples similar to the present additives are all encompassed by the present formula (I). At least first compound shown in the reference example 3 inherently anticipates the claimed compound of formula (I).

5. Claims 47-54 and 57-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 0055110 or equivalent US 6,733,690 above cited.

The reference teaching has previously set forth in section above. The reference further the polymerizable compounds are useful as curable liquid crystals and for preparing liquid crystal films and optical devices. The reference further discloses that the film comprises the mixture containing a liquid crystal host and at least one chiral and achiral additive. The reference differs from the present claims in that the claimed mixtures have additives with transition temperature  $20\text{ }^{\circ}\text{C}$  or lower from liquid crystal state to the isotropic state. Although the present mixtures are not exemplified by the reference, it would have been obvious to those skilled in the art to utilize the reference compounds having similar structure of the present additives to arrive at the claimed invention.

### **Response to Arguments**

6. Applicant's arguments with respect to claims 47-65 have been considered but are moot in view of the new ground(s) of rejection. Applicant's attention is directed to the first compound disclosed in the reference example 3, which is encompassed by the present formula (I) and has

Art Unit: 1722

similar structure to the present additive No. 8. Therefore the rejection over US '690 is still maintained. Applicants also argued that the reference mixtures have higher transition temperature. The examiner agrees such statement. However, the claimed compound has lower transition temperature, not a mixture. The claimed compound is **an additive** of claimed mixture. There are no evidences to show that the present additive No. 8 has lower transition temperature than the reference example 3.

Also, the Sp in the present formula III can be just a straight alkyl chain when  $B^1 = C$  ( $m^2=1$ ) and  $R^1=R^2=H$ . Therefore, the compound of the reference example is still encompassed by the present formula (I).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shean C. Wu whose telephone number is 571-272-1393. The examiner can normally be reached on 10:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kelly Cynthia can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1722

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shean C Wu/  
Primary Examiner, Art Unit 1722